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RESEARCH BRIEF

Relationships Between Myers-Briggs Type Indicators and NAPLEX Performances

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Objective. To examine the relationships between pharmacy students' Myers-Briggs Type Indicators (MBTIs) and their first-attempt NAPLEX scores within an accelerated, dual campus curriculum.

Methods. Data from the MBTIs and NAPLEX findings were retrieved from a single cohort of the Columbia, SC and Savannah, GA campuses of South University School of Pharmacy. A multiple linear regression technique was performed to assess the degree of variability in first-attempt NAPLEX scores that could be accounted for by MBTIs, campus of enrollment, and gender.

Results. Of the 134 student data samples collected, 119 (86%) were included for study analysis. Campus of enrollment and MBTIs were predictive of first-attempt NAPLEX scores. Introversion personality types scored 9.5 points higher on the NAPLEX than extroversion types; feeling personality types scored 6.0 points higher than thinking types; students enrolled at the Savannah, GA campus scored 5.7 points higher than their Columbia, SC campus counterparts.

Conclusion. Certain personality types were shown to have predictive value with regard to first-attempt NAPLEX score achievements. These results offer plausible insights into pharmacy student tendencies that can affect success on high-stakes standardized examinations. Additional research into sociological aspects of pharmacy students' composition may assist with optimizing performances on licensure examinations as prerequisites to proficient careers within the pharmacy profession.

Keywords: NAPLEX, MBTI, personality type

INTRODUCTION

Transitioning from the role of a pharmacy student to a licensed pharmacist can be described as a gratifying experience. Excitement about this newly minted professional status is often transient being tempered by upcoming licensure requirements. Achievements that warrant a doctor of pharmacy (PharmD) degree, along with the credence applied to their claims from accreditation standards, have routinely been established.[1-3] However, a high-stakes examination that tests the durability of graduates' pharmacy education has yet to be completed. The North American Pharmacy Licensure Examination (NAPLEX) reflects a collection of competencies that candidates must satisfy to authenticate readiness to practice pharmacy.[4] Distributions of first-time NAPLEX pass rates over a three-year period have featured some schools faring better in preparing their students for success on the NAPLEX than others.[5] As a result, educational strategies and characteristics that lead to better performances on the NAPLEX have been continually discussed.[6-10] However, literature about behavioral components that may predispose students to NAPLEX success has been introduced far less.

Myers-Briggs Type Indicators (MBTIs) provide dispositional details about participants that can be used in a variety of settings. Dichotomous in nature, selections of either Extraversion or Introversion (E-I); Sensing or Intuition (S-N); Thinking or Feeling (T-F); Judging or Perceiving (J-P) comprise four letter synopses that populate upon completion.[11-19] Touted as a long standing resource for personality probing, the MBTIs function to allow users to become more acquainted with emotional factors, such as stress, that contribute to their overall existence.[20] While interpretations of the MBTIs are often variable depending on the frame of reference assumed,[11-19, 21-23] the tool works to create a sense of self-awareness that aims to foster introspection. As it pertains to employment considerations, sustained emphasis has been placed on the influences of MBTIs on hiring and training practices.[24-26]

Researchers have also evaluated relationships among MBTIs with respect to both academic and professional performances in health care disciplines such as dentistry and nursing.[24-26]

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Approximately two decades have elapsed since a large study was performed within a pharmacy college that sought to identify different personality types.[27] This study itself spanned a 10-year timeframe, creating even more calendar distance from the results that were generated.

At the author's institution, the MBTIs are used in two predominant ways. Certain faculty advisors to student organizations consult the MBTIs to guide recommendations to pharmacy students for service opportunities within the community and academic setting. The professional activities that are recommended to students typically coincide or collide with their identified MBTIs to better position the students for overall professional growth. A proportion of faculty members also use the MBTIs when conducting mock interview sessions with students to prepare them for future employment opportunities. Awareness of the students' MBTIs prior to the mock interview sessions has assisted in the creation of questions and scenarios that are tailored to each student's professional outlook. Investigations into associations between MBTIs and performances on standardized examinations that guide curriculums of colleges and schools of pharmacy are not as apparent. The purpose of this study was to examine the relationships between pharmacy students' MBTIs and their respective scores generated on first-attempt NAPLEX administrations.

METHODS

This was an IRB-approved, single-institution study wherein the findings from the MBTI assessments of a single cohort from the Columbia, SC and Savannah, GA campuses were analyzed. Administration of the MBTI took place during the annual pharmacy school orientation program and the results were housed in a shared location for subsequent personnel use. From this same professional year cohort, first-attempt NAPLEX results were collected and matched to the corresponding MBTIs. In efforts to determine how much variability in the NAPLEX scores could be attributed to the independent study variables (MBTIs, campus, and gender), and to address the intent of this study, a multiple linear regression technique was used.

Outliers (outside of ±3 standard deviations) and influential points in the data were examined using Casewise diagnostic procedures. Outliers detected in the study sample exceeding the standard deviation (SD) parameters of ±3 were removed. Grade point averages (GPAs) of students represented in the study corresponded to the end of their didactic period and were used to control for the academic standing of students on each campus. Data analyses were performed using IBM SPSS Statistics for Windows, v24 (IBM Corp., Chicago, IL). A *p*-value of $<.05$ was considered statistically significant.

RESULTS

There were 139 MBTI personality reports generated. Of this total, 119 (86%) had an accompanying NAPLEX score and were included in the study. Forty-nine of the 119 MBTI reports in the sample were from the Columbia, SC campus (41%); 70 were from the Savannah, GA campus (51%); females represented 76 MBTI reports (64%). Of the 119 study samples, 80 classified as extroversion (67%), 39 as introversion (33%), 72 as sensing (61%), 47 as intuition (39%), 44 as thinking (37%), 75 as feeling (63%), 110 as judging (92%), and nine as perceiving (8%). The delineations of MBTI personality subtypes and their percentage contributions to the overall study sample can be found in Table 1. The average NAPLEX score from the study cohort was 96. Independent variables mutually accounted for 17% of the variation in NAPLEX scores with adjusted $R^2=12.4\%$. Case-wise diagnostics were performed and no residuals were found to be outside of ±3 SD. The cumulative GPAs at the end of the didactic period of students enrolled on the Savannah, GA in comparison to the Columbia, SC campus were 3.42 and 3.23, respectively.

Notably, campus of enrollment was shown to feature distinctly different NAPLEX scores, where enrollees on the Savannah, GA campus scored 5.7 points higher than those on the Columbia, SC campus ($p=.03$). Other statistically significant findings among MBTIs and NAPLEX scores revealed introversion types scored 9.5 points higher on the NAPLEX than extroversion types ($p<.01$); and feeling types scored 6.0 points higher than thinking

Table 1. Myers-Briggs Personality Type Indicators by Aggregate Category Scores

Category[a]	Participants (N)	(%) Total
ISTJ	10	8.4
ISFJ	12	10.1
INFJ	5	4.2
INTJ	9	7.6
ISTP	2	1.7
ISFP	1	0.8
INFP	0	0
INTP	0	0
ESTP	2	1.7
ESFP	4	3.4
ENFP	0	0
ENTP	0	0
ESTJ	9	7.6
ESFJ	32	26.9
ENFJ	21	17.7
ENTJ	12	10.1

[a]E=Extroversion, I=Introversion, S=Sensing, I=Intuition, T=Thinking, F=Feeling, J=Judging, P=Perceiving

types (p=.03). In an attempt to account for confluence among the study variables, the number of students with statistically significant predictors, ie, introversion and feeling personality types, was found not to be significantly different by campus (Introverts: COL=35, SAV=45; p=.41 | Feeling: COL=32, SAV=43; p=.67). The coefficients of the multiple linear regression equation along with their associated 95% confidence intervals and respective p values can be found in Table 2.

DISCUSSION

A consistent elevation in first-attempt NAPLEX pass rates is a shared challenge among pharmacy schools and colleges. Curriculum adjustments are prone to occur in response to trends in performances.[1,6] Revisiting instructional delivery has also been suggested to enhance retention and ostensibly garner more favorable NAPLEX outcomes.[6] Substantial research remains devoted to exploring indicators of pharmacy students' academic fortitude that are thought to precipitate NAPLEX success.[1,6-8] The research performed here sought to depart as much as possible from the recurring reliance on academic pedigree postulated to have NAPLEX implications,[1,6-8] and examine intrinsic decision-making compulsions as predictors of NAPLEX success. The author is aware of the difficulty in separating pharmacy students' academic track records from their respective personality types. However, this investigation highlighted differences in licensure pass rates noted among the dichotomous MBTI categories and the campus of enrollment.

In light of the introversion-extroversion comparison observed in this study, researchers have contended that extroverts, while possessing galvanizing and assertive personalities, may be too verbose at times fostering a diminished ability to effectively comprehend instructions.[11,17-21,24] Applying this perceived difficulty to lower performances on the NAPLEX than their introverted counterparts displayed here may be explanatory. Conversely, a common thread observed among introverts is their considerable attention to detail.[10] For an examination that comprehensively assesses a wide body of pharmacy knowledge, such meticulous preparations could translate to a larger margin of victory than extroverts. External to the profession of pharmacy, evidence of higher introvert than extrovert achievements has also emerged. Jones and colleagues similarly found that cohorts of introverts performed significantly higher on two separate phases of a dentistry board examination in comparison to their extroverted peer groups.[24]

In the context of feeling versus thinking personality types, a recent study evaluated students' MBTI scores and stress levels.[20] It was found that thinking personality types were significantly correlated with elevated stress levels. No correlation between feeling personality types and higher stress levels were observed. If these findings are consistent internationally, excessive stress levels may have contributed to the disparity in NAPLEX scores observed here between the thinking and feeling personality types. While discrepant NAPLEX scores were shown between the two campuses, this finding should be viewed in the larger scope of an existing debate presented by two sets of researchers with different views on the impact of distance education.[8,9]

Research on personality types by Shuck and Phillips portrayed a sample size nearly 10-fold larger than the one presented here.[27] Their investigation was also performed over a longer time period. Their sample volume provided additional support to the trends in personality types seen. However, their findings were not analyzed in the context of implications for, or projections of, performances on high stakes standardized examinations.

Findings from research conducted among medical students involved in a specialized clinical clerkship featured a significantly positive correlation between a specific MBTI personality type and clinical evaluations.[23] Although these results are limited to a single practice

Table 2. Statistical Analysis Components of Independent Study Variables

Variables	NAPLEX Score Change[b]	*t*	*p* value	95% CI
(Constant)	86.3	25.6	.00	(79.7, 93.0)
Extroversion: Introversion	9.5	3.5	<.01[a]	(4.2, 14.9)
Sensing: Intuition	-.2	-.1	.93	(-5.5, 5.0)
Thinking: Feeling	6.0	2.2	.03[a]	(.6, 11.4)
Judging: Perceiving	-2.5	-.5	.61	(-12.1, 7.2)
Columbia, SC: Savannah, GA	5.7	2.4	.03[a]	(.7, 10.7)
Females: Males	-2.1	-.8	.45	(-7.6, 3.4)

[a]p<.05 considered statistically significant

[b]NAPLEX Score Change is interpreted from right to left among positive values and left to right among negative values. Introversion scored 9.5 points higher on the NAPLEX than extroversion types. Sensing scored .2 points higher on the NAPLEX than intuition types

CI=Confidence Interval

environment, complementary roles often exist among medical and pharmacy students in various health care settings. Associations of MBTI with clinical functionalities of medical students may therefore extrapolate to advanced pharmacy practice experiences under certain conditions.

As uptake of personal and professional development activities continues to increase, [3] the MBTIs could be used to leverage areas of strengths that students possess. Each domain in Standard 4: Personal and Professional Development of Section 1: Educational Outcomes calls upon a different set of skills to demonstrate proficiency. Descriptions of key elements such as "Self-awareness" and "Leadership" depict qualities that may be examined against the backdrop of students' MBTIs. Parallels between MBTI aspects and self-awareness of student leadership capabilities in a different academic setting were studied.[22] Student leaders who worked to affirm the values of their followers, while maintaining a realistic view of their own limitations, identified with three of the eight individual MBTI delineations. Correspondingly, MBTI utilizations in pharmacy curricula would aim to foster a similar degree of self-awareness while helping to create unique learning opportunities that satisfy accreditation charges.

Prior to enrollment, incorporation of MBTIs during admission interview sessions at pharmacy schools and colleges could augment decision-making processes through earlier comparisons of organizational cultures to candidates' personalities. The results could also better guide faculty and staff about the characteristics of pharmacy students accepted into the program will bring with them.

Knowledge of matriculating MBTI associations may facilitate more meaningful faculty advising sessions that highlight the individuality of each pharmacy student.

There were several limitations to this study. This was a single institution, single-cohort study. The impact of the results displayed here may not be reproducible in different academic settings. Further, student disclosures of their overall MBTI personality assessments were not substantiated. It is feasible that truthfulness was not applied to all survey items. There were also notable differences in the number of students per campus and by gender within the study. Nearly twice as many MBTI reports were on the Savannah, GA campus in comparison to the Columbia, SC campus. Similarly, the male representation was a little more than half of their female counterparts. Pre-pharmacy GPAs by campus were not assessed. Students at the Savannah, GA campus may have been admitted with higher scholastic promise than students at the Columbia, SC campus. This possibility, coupled with the aforementioned higher cumulative GPAs on the Savannah, GA campus at the end of the didactic period, could have positioned one campus to experience a greater degree of achievement on the NAPLEX than the alternate campus.

CONCLUSION

Consistent improvement in first-time NAPLEX pass rates remains a common goal among pharmacy schools and colleges. Therefore, pharmacy education is reliant upon approaches that assume a more proactive response to bolstering NAPLEX performances. Querying attributes such as personality traits in advance of curricula deliveries can yield earlier awareness into the constitutions of matriculating pharmacy students. As a result, resources such as MBTIs can have a guiding influence on instructional and learning techniques, with aspirations of facilitating greater success on the NAPLEX and in the profession of pharmacy.

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